

# Career Center

## PhD Biotech Resume Example



**Ting "Patrick" Chao**

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### Protein biology / Computational modeling

More than 8 years of academic lab experiences; industrial experience in Novozymes R&D and Roche R&D. Trained and skilled in molecular biology, protein purification and spectroscopy techniques; 5 years of experience in analyzing large data set using mathematical/computational approaches, strong problem solving and data analysis skills; experienced in equipment operational trainings and presentations.

### Skills

#### MOLECULAR BIOLOGY AND PROTEIN PURIFICATION

E.coli system protein expression	Protein gel electrophoresis
Molecular cloning	Size-exclusion chromatography
PCR (polymerase chain reaction)	Ion chromatography
DNA amplification and purification	HPLC(high-performance liquid chromatography)

#### SPECTROSCOPY AND SPECTROMETRY

UV-Vis spectroscopy	Mass spectrometry
Fluorescence spectroscopy	Amino acid analyzer
Circular Dichroism spectroscopy	NMR (Nuclear Magnetic Resonance spectroscopy)
Empower software	(protein solution 2D & high dimensional NMR)

#### COMPUTER SKILLS

Mathematica	C++
R language	Microsoft Office (Word, PowerPoint, Excel)

### Research Experience

#### Industrial R&D Intern

**ROCHE DIAGNOSTICS CORPORATION, INDIANAPOLIS, IN**

**JUN. 2016 - AUG. 2016**

Contribute analytical methods to facilitate glucose meter development

- Developed fluorescence spectroscopy based methods to determine biochemistry reaction rate
- Documented potential protocol and future suggestions for rate determination
- Worked in a GXP (GLP) environment with a large team

**NOVOZYMES NORTH AMERICA INC., FRANKLINTON, NC**

**JUN. 2015 - AUG. 2015**

Optimize enzyme performance for bioethanol production

- Designed a variety of experiments with members of the team
- Developed methods for protein acid hydrolysis and implementing amino acid analyzer
- Discovered the mechanisms behind current enzyme performance issues facing 2nd generation bioethanol production

#### Research Assistant

**DUKE UNIVERSITY, SCHOOL OF MEDICINE**

**AUG. 2014 - DEC. 2017**

Experimentally characterizing the performance of a novel drug delivery system based on ELP proteins

- Collaborated with scientists in the department of Biomedical Engineering
- Developed novel spectroscopy methods to characterize molecular structures of ELP-based drugs
- Provided further understanding of how helical peptide drugs can stay active when using ELP proteins as delivery system





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### DUKE UNIVERSITY, SCHOOL OF MEDICINE

AUG. 2011 - DEC. 2017

Combining experimental / computational approaches to describe the mechanism of protein folding

- Routinely use high performance liquid chromatography, mass spectrometry & spectroscopy techniques
- Teamed with lab colleagues and NMR facility scientists to design and execute experiments
- Experimentally measured the flexibility (protein dynamics) of a protein( $\lambda$  repressor fragments) in solution
- Developed computational / biophysical models to quantitatively describe protein dynamics
- Improved the accuracy significantly when predicting the flexibility of proteins

### DUKE UNIVERSITY, SCHOOL OF MEDICINE

JUN. 2010 - AUG. 2011

Measuring biophysical properties of a large bacterial protein to discover its evolutionary origin

- Led the design in automating repetitive fluorescence spectroscopy measurements
- Implemented the automation in the collection of fluorescence titration data for several projects
- Analyzed experimental data through computation modeling
- Determined the biophysical parameters (thermodynamics stability) in different parts of the protein (tandem-repeated domains) to depict how this protein helps bacteria survive

## Training and Teaching Experience

Provided equipment operational trainings on experimental instruments to students and researchers in multiple departments

- Developed procedures for the training process on equipment operation and safety
- Designed and optimized experiments for each individual user
- Analyzed and suggested theoretical explanations for each user's results

Led group discussions of research ethics

- Led the group members to express opinions on keeping good research ethics
- Designed materials to engage the group in active discussions

Acted as teaching assistants in 3 graduate school courses

- Assisted in Structural Methods & Structural Biochemistry I/II
- Tutored students during office hours to understand course materials

## Education

Duke University, School of Medicine, Dept. of Biochemistry – Ph.D. Dec. 2017 (GPA 3.96)

Nankai University (China), Department of Life Science – B.S. 2010 (GPA 3.78)

## Publications

- (In preparation) Hughes RG., **Chao T.**, Oas TG., Schmidler SC. (2018). A Combined Biophysical-Statistical Model for Interpreting Amide Hydrogen Exchange Measurements. *Biophys. J.*
- (Submitted) Roberts S., Schaal J., Harmon TS., **Chao T.**, Hunt A., Miao V., Wen Y., Oas TG., Collier J., Pappu RV., Chilkoti A. (2017) Modulation of Order and Disorder in Recombinant Polypeptides Creates Injectable Tissue Integrating Network. *Nature*
- Yang W., **Chao T.**, Bai Y., Zhou R., Zhou W. & Bartlam M. (2010). Expression, purification, crystallization and preliminary crystallographic analysis of PA3885 (TpbA) from *Pseudomonas aeruginosa* PAO1. *Acta Cryst. F66*, 1473-1476.

## Honors and Activities

Department PhD Outstanding Poster Award (2012)

3 years of excellent scholarships of Nankai University (2006-2009)

Attended International Conference for Bio-economy, P.R.China (June 2009)

Attended 28th Annual Symposium of The Protein Society, San Diego, CA (July 2014)

Presented a poster titled "Developing NMR Methods For Predicting Residue Helicity Of MetO- $\lambda$  Unfolded State"

2 departmental seminar presentations for graduate school research